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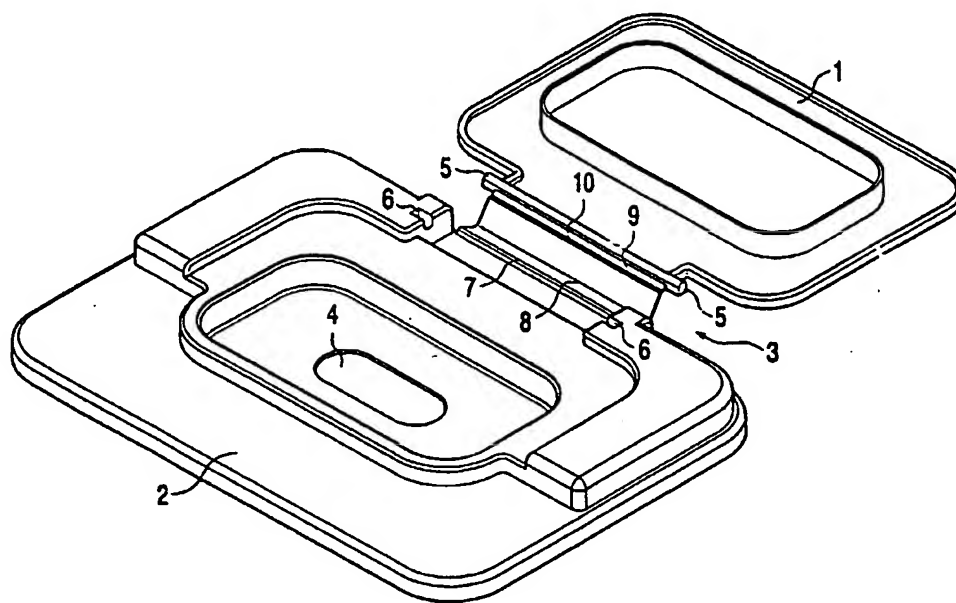
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(54) Title: **HINGE ASSEMBLY AND PACKAGING**



(57) Abstract: The invention relates to a hinge assembly for connecting a lid to a container, comprising a lid hinge part which engages pivotally on the container round a lid pivot axis, and a container hinge part which engages pivotally on the container round a container pivot axis, wherein the lid hinge part and the container hinge part are connected for pivoting relative to each other round a coupling pivot axis. The invention also provides a packaging consisting of a container closable with a lid, wherein the lid is connected pivotally to the container via a hinge assembly as described above.

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Hinge assembly and packaging

The invention relates to a hinge assembly for connecting a lid to a container. The invention also relates to a packaging provided with such a hinge assembly.

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Many products, in particular consumer products, are packaged in a container closable with a lid, wherein the lid is coupled pivotally to the container. In order to open or close the packaging the lid must be grasped so as to then pivot it into the desired position.

Such a packaging has a relatively simple construction and can thus be manufactured for a limited price. A drawback is that displacement of the lid relative to the container generates a reactive force which is exerted on the container by the lid. Depending on the resistance with which the lid is pivotable relative to the container and the weight of the container, this effect makes it necessary to stabilize the container in order to displace the lid. This takes place in practice by grasping the container with one hand and simultaneously displacing the lid with the other hand. A drawback of this construction is that two hands are therefore necessary in opening or closing of the packaging. While packagings are also known with a container and lid which can be opened with one hand, such packagings are provided with a complex, and thus expensive, mechanism in which during closing a biasing element is tensioned such that unlocking of the lid results in forced opening of the lid. In addition to a biasing element, such packagings are provided with a locking mechanism.

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The present invention has for its object to provide a hinge assembly and packaging whereby a lid can be opened or closed with only one hand without a complex construction being required for this purpose.

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The invention provides for this purpose a hinge assembly for connecting a lid to a container, comprising a lid hinge part which engages pivotally on the container round a lid pivot axis and a container hinge part which engages pivotally on the container round a container pivot axis, wherein the lid hinge part and the container hinge part are connected for pivoting relative to each other round a coupling pivot axis. The lid hinge part is preferably rigidly connected to the lid, more preferably such that the lid hinge part lies on the side of the lid pivot axis remote from the lid. For a smooth action the lid pivot axis, container pivot axis and the coupling pivot axis run substantially parallel to

-2-

each other. It is further recommended for a good operation that the distance from the lid pivot axis to the coupling pivot axis plus the distance from the container pivot axis to the coupling pivot axis is greater than the distance from the lid pivot axis to the container pivot axis. Such a hinge assembly provides a considerable freedom of design.

5 With the mutual position of the lid pivot axis and the container pivot axis the angle can thus be determined over which the lid has to be rotated until, from closed position, a stable opened lid position is achieved. Another very important advantage is that the hinge assembly according to the invention can be manufactured in very simple manner, wherein this is coupled to a great convenience of use of the hinge assembly.

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The hinge assembly can be embodied such that at least one of the pivot axes is formed by a film hinge. The advantage of employing a film hinge, particularly in the coupling pivot axis and the container pivot axis, is that the hinge assembly can be moulded as a single element in an injection-moulding machine. The advantage of a hinge assembly
15 which is assembled from a basic element is that the assembly thereof is relatively simple and that the production logistics in particular also remain readily manageable. On the other hand it is also possible to form at least one of the pivot axes with a mechanical hinge. The lid pivot axis in particular can be formed by a mechanical hinge which can for instance be realized by snapping on parts moulded for this purpose onto lid and
20 container. A hinging of the lid relative to the container can thus be realized which has a limited resistance.

In preferred embodiments it is possible to cause the distance between container pivot axis and coupling pivot axis, respectively lid pivot axis and coupling pivot axis to
25 change under the influence of an external load. This is possible for instance by providing the container hinge part respectively the lid hinge part with a resilient element. In another preferred embodiment the distance between container pivot axis and lid pivot axis can be changed under the influence of an external load. This can be realized for instance by giving the container a deformable form at the position of the
30 container pivot axis. The advantage of all these particular preferred embodiments is that the maximum resistance which must be overcome in order to displace the lid from a stable closed position to a stable opened position, or vice versa, is limited.

-3-

In yet another preferred embodiment of the hinge assembly, at least one of the hinge parts is provided with a point of application for exerting an external load. A particular embodiment hereof is a container hinge part which is manufactured from a substantially form-retaining material and in a cross-section of the container hinge part

5 perpendicularly of the pivot axes has an angular shape. By exerting an external load, in particular a pressure load, on the hinge assembly it is thus possible to realize that the lid is displaced from a stable closed position to a stable opened position. The exertion of a pressure load is a relatively simple operation which can be performed with only one hand. Such a hinge assembly thus makes it possible to realize packagings which are

10 very simple to open. An additional aspect is that it is also possible in the case of smaller containers to enclose these with a hand and then, using the thumb of the hand in question, or optionally one or more of the fingers of this hand, to exert a pressure force on the hinge assembly such that the lid opens. A simplified connection of the hinge assembly can be realized by giving the container hinge part an angular form.

15 The invention also provides a packaging consisting of a container closable with a lid, wherein the lid is connected pivotally to the container via a hinge assembly as described above. The packaging is preferably provided herein with at least one pressure area for exerting pressure on the hinge assembly from a closed position of the packaging such

20 that the packaging opens. The advantages of such a packaging have already been described above with reference to the hinge assembly according to the invention; the most important advantages are a relatively simple construction which can be realized at limited cost and which can be operated in simple manner without limiting other practical functions. It is noted here that the hinge assembly can be manufactured directly

25 with an attached container and attached lid. The whole packaging can thus be manufactured as a single injection moulded part.

The pressure area for opening the packaging using a pressure force can form part of the hinge assembly. In another embodiment the packaging is also provided with force

30 transmitting means and a pressure area which is situated at a distance from the hinge assembly and which is in connection with the hinge assembly via the force transmitting means such that a force exerted on the pressure area is transmitted by the force

transmitting means to the hinge assembly in order to open the packaging. While the construction wherein the pressure area forms part of the hinge assembly is simpler, it has the design limitation that the pressure area can only be placed close to the hinging side of the lid, which may be undesirable in practice. The preferred embodiment with
5 force transmitting means enables the arrangement of the pressure area at a random position in the packaging, which for instance also provides the option of placing the pressure area close to the side of the lid remote from the lid pivot axis.

The present invention will be further elucidated with reference to the non-limitative
10 embodiments shown in the following figures. Herein:
figure 1 shows a perspective view of a lid with container part which are connected by a hinge assembly according to the invention for assembly of the components,
figure 2 shows a perspective view of the lid with container part shown in figure 1 in assembled, closed situation,
15 figure 3 is a schematic cross-section through a hinge assembly according to the invention,
figures 4a and 4b are schematic cross-sections through different design variants of the hinge assembly according to the invention, and
figures 5a-5d show schematic cross-sections through four embodiments of the hinge
20 assembly according to the invention.

Figure 1 shows a lid 1 which is manufactured integrally with a container part 2 with interposing of a hinge assembly 3. Container part 2 is provided with a central opening 4 through which for instance specially folded moist tissues can be removed. It is noted
25 that container part 2 can be snapped onto another container part (not shown) so as to jointly form the container. When reference is made in this document to a container, this can also be understood to mean a container part, as it is irrelevant for the invention how many components the container consists of. What is important is that hinge assembly 3 engages on the container (or a container part 2).

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Lid 1 is provided with projecting protrusions 5 which are embodied such that they can be clamped rotatably in recesses 6 in container part 2 arranged for this purpose. In

combination with recesses 6 the protrusions 5 thus form a mechanical lid hinge. Hinge assembly 3 engages on container part 2 by means of a container film hinge 7. Situated on the side of container film hinge 7 remote from container part 2 is a container hinge part 8 which takes an angular form (for this variant see also figure 5a). On the side remote from container film hinge 7 the container hinge part 8 engages on a lid hinge part 9 via a coupling film hinge 10. Lid hinge part 9 extends from a line through protrusions 5 to the coupling film hinge 10 and thus forms a rigid whole with lid 1. The whole of lid 1, container part 2 and hinge assembly 3 can be manufactured in a single injection moulding process.

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Figure 2 shows a view of lid 1, container part 2 and hinge assembly 3 in an assembled situation. Lid 1 is in a closed position wherein protrusions 5 are arranged in recesses 6 of container part 2. As is clearly visible, the lid hinge part 2 forms one whole with lid 1. Lid 1 can be opened by gripping on the edge of lid 1 remote from hinge assembly 3. It is however also possible to open lid 1 by pressing on lid hinge part 9.

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Figure 3 shows a schematic cross-section through the assembly of lid 1, container part 2 and hinge assembly 3 as shown in figures 1 and 2. Corresponding components are designated with the same reference numerals. Clearly visible is that hinge assembly 3 engages at two positions on container part 2. These positions are formed by container film hinge 7 (=container pivot axis 7) and a lid pivot axis 11. In figures 1 and 2 the lid pivot axis 11 was formed by protrusions 5 in co-action with recesses 6. In the position of hinge assembly 3 and lid 1 shown by means of full lines, the lid 1 is in a closed position. By exerting sufficient pressure on lid hinge part 9 or container hinge part 8 the lid 1 can be displaced to an opened position shown by means of broken lines.

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Figure 4a shows an assembly of lid 1, container part 2 and hinge assembly 3 which is comparable to figure 3. Shown here is that lid 1 must be rotated through an angle α from the closed position shown by means of full lines in order to reach a neutral intermediate position. It is noted that this is not a stable position. When lid 1 is pivoted further upward through a total angle β , the stable opened position is reached.

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Figure 4b shows a construction which is comparable to the construction shown in figure 4a but where the relative length of lid pivot axis 12 and container pivot axis 13 differs relative to the situation shown in figure 4a. The lengths of container hinge part 14 and lid hinge part 15 also differ from the situation shown in figure 4a. The result hereof is
5 that the angle α for displacing lid 1 from a closed position to a neutral position is greater than the comparable angle α of figure 4a. The angle β which corresponds to the angular displacement of lid 1 from a stable closed position to a stable opened position is also greater than the comparable angle β of figure 4a. By varying the mutual positions of lid pivot axis 12 and container pivot axis 13 and the lengths of container hinge part 14 and
10 lid hinge part 15 the desired functionality in respect of angles α and β can thus be realized.

Figure 5a shows a hinge assembly 16 with a container hinge part 17 which has an angular form. It is thus possible to have a free choice of the appearance of the hinge
15 assembly and the location of possible pressure areas for opening the lid 1.

Figure 5b shows a hinge assembly 18 with a container hinge part 19 which is provided with a resilient part. The maximum resistance with which the lid 1 has to be forced through the neutral position can thus be influenced (see angle α in figures 4a and 4b).
20

Figure 5c shows yet another hinge assembly 20 in which a coupling pivot axis 21 is placed such that a force exerted according to arrow P1 enables opening of lid 1 provided sufficient force is exerted. Containers can thus be manufactured, preferably of a small size, which can be held in a hand, wherein using a thumb a force can be exerted on
25 hinge assembly 20 in the direction P1 such that lid 1 opens. This is particularly practical for small shaker packagings such as are applied for instance for spices, confectionery, pastas, other foodstuffs which can be sprinkled, and so on.

Figure 5d shows a hinge assembly 22 on container hinge part 8 on which there engages
30 a pull rod 23. Pull rod 23 is connected to container part 2 on the side remote from container hinge part 8 via a support rod 24 such that, when a pressure force is exerted according to arrow P2 on pull rod 23, this results in a rotation according to arrow P3 of

-7-

the end of the pull rod 23 remote from container hinge part 8. This rotation of pull rod 23 has the consequence that a tensile force is exerted on container hinge part 8, with the result that lid 1 is pivoted upward. It is thus possible to place the control for opening the lid 1 where this is desired. In order to be closed, lid 1 must be grasped at some distance
5 from lid pivot axis 11 and thus forced back to the position shown in figure 5d.

Although the invention is described with reference to only a few embodiments, it will be apparent to all that the invention is by no means limited to the described and shown
embodiments. Nor are the possible applications of the invention are limited to the stated
10 examples. Some other examples are containers or boxes for diverse supplies, washing
powder, tissues and so on. Closures of containers for liquids, pastes, personal care
products, glues and so on can also be provided with a hinge assembly according to the
invention. Diverse forms of container are possible as containers, such as for instance
plastic boxes, tubes, bottles and so on. It will be apparent that many more variations are
15 possible for the skilled person within the scope of the invention.

Claims

1. Hinge assembly for connecting a lid to a container, comprising:
- a lid hinge part which engages pivotally on the container round a lid pivot axis, and - a
5 container hinge part which engages pivotally on the container round a container pivot
axis, wherein
the lid hinge part and the container hinge part are connected for pivoting relative to each
other round a coupling pivot axis.
- 10 2. Hinge assembly as claimed in claim 1, wherein the lid hinge part is rigidly
connected to the lid.
3. Hinge assembly as claimed in claim 1 or 2, wherein the lid hinge part lies on the
side of the lid pivot axis remote from the lid.
- 15 4. Hinge assembly as claimed in any of the foregoing claims, wherein the lid pivot
axis, container pivot axis and the coupling pivot axis run substantially parallel to each
other.
- 20 5. Hinge assembly as claimed in any of the foregoing claims, wherein the distance
from the lid pivot axis to the coupling pivot axis plus the distance from the container
pivot axis to the coupling pivot axis is greater than the distance from the lid pivot axis to
the container pivot axis.
- 25 6. Hinge assembly as claimed in any of the foregoing claims, wherein at least one
of the pivot axes is formed by a film hinge.
7. Hinge assembly as claimed in any of the foregoing claims, wherein at least one
of the pivot axes is formed by a mechanical hinge.

8. Hinge assembly as claimed in any of the foregoing claims, wherein the distance between container pivot axis and coupling pivot axis can be changed under the influence of an external load.
- 5 9. Hinge assembly as claimed in any of the foregoing claims, wherein the distance between lid pivot axis and coupling pivot axis can be changed under the influence of an external load.
- 10 10. Hinge assembly as claimed in any of the foregoing claims, wherein the distance between container pivot axis and lid pivot axis can be changed under the influence of an external load.
11. Hinge assembly as claimed in any of the foregoing claims, wherein at least one of the hinge parts is provided with a point of application for exerting an external load.
- 15 12. Hinge assembly as claimed in any of the foregoing claims, wherein the container hinge part is manufactured from a substantially form-retaining material and a cross-section of the container hinge part perpendicularly of the pivot axes is provided with an angular shape.
- 20 13. Packaging consisting of a container closable with a lid, wherein the lid is connected pivotally to the container via a hinge assembly as claimed in any of the foregoing claims.
- 25 14. Packaging as claimed in claim 13, wherein the packaging is provided with at least one pressure area for exerting pressure on the hinge assembly from a closed position of the packaging such that the packaging opens.
- 30 15. Packaging as claimed in claim 14, wherein the pressure area forms part of the hinge assembly.

16. Packaging as claimed in claim 15, wherein the packaging is also provided with force transmitting means and a pressure area which is situated at a distance from the hinge assembly and which is in connection with the hinge assembly via the force transmitting means such that a force exerted on the pressure area is transmitted by the force transmitting means to the hinge assembly in order to open the packaging.
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1/3

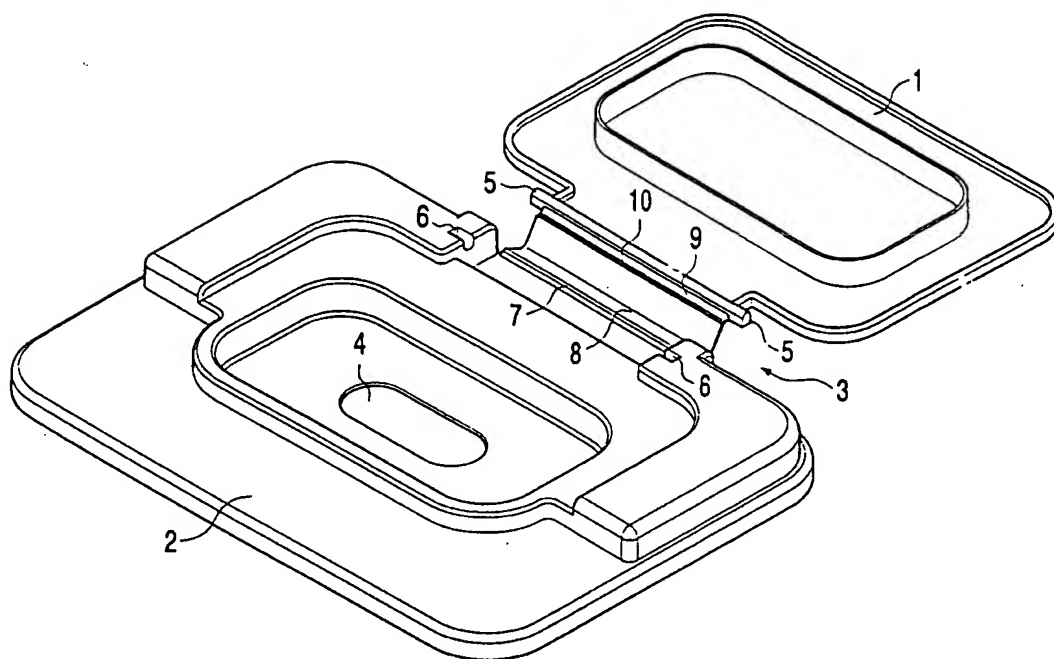


FIG. 1

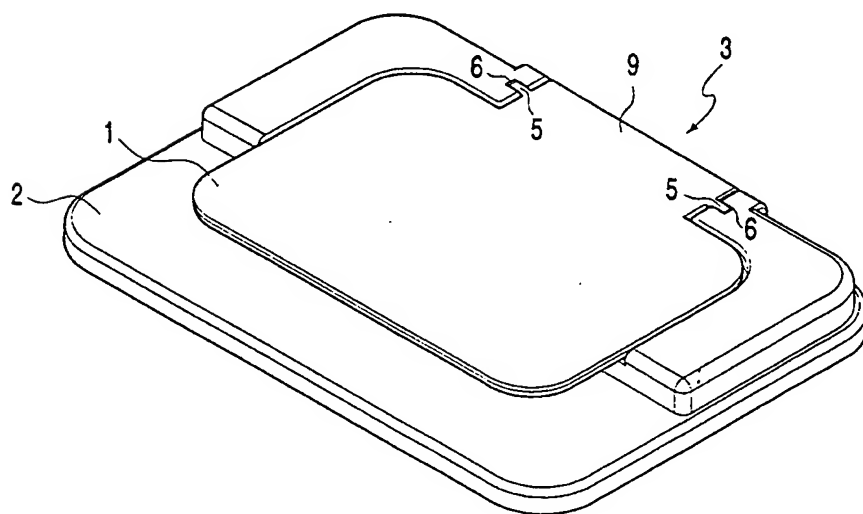


FIG. 2

2/3

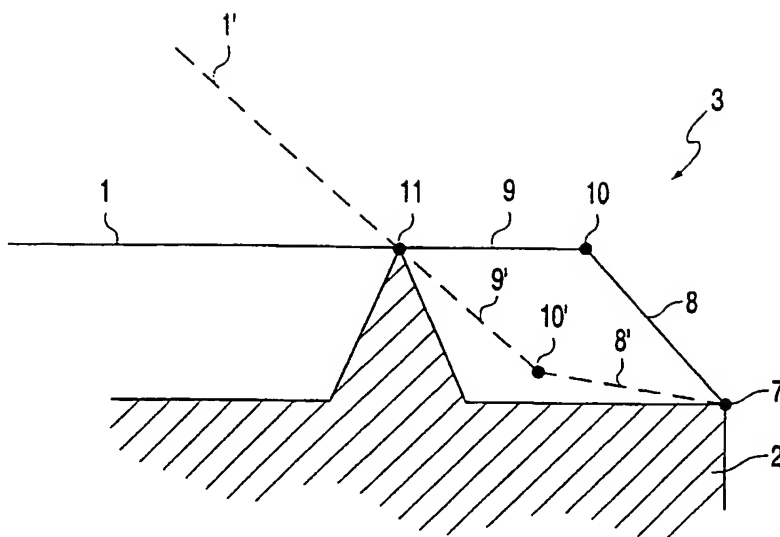


FIG. 3

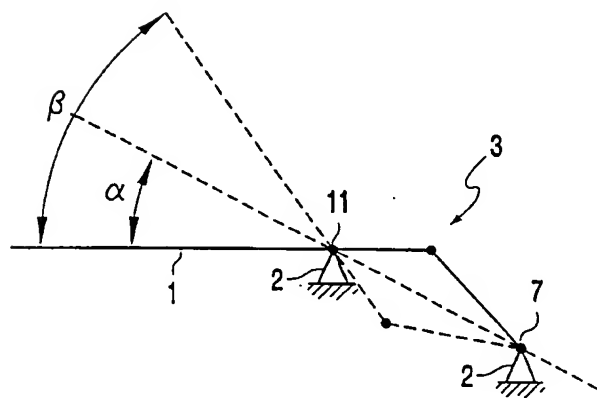


FIG. 4A

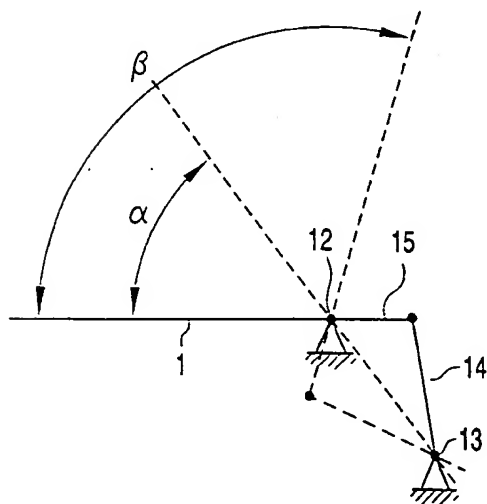


FIG. 4B

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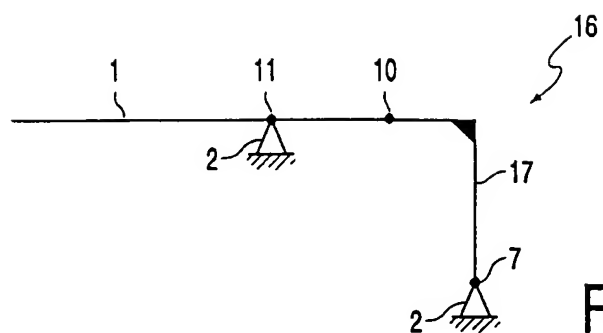


FIG. 5A

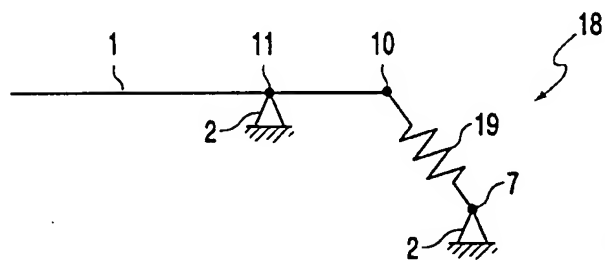


FIG. 5B

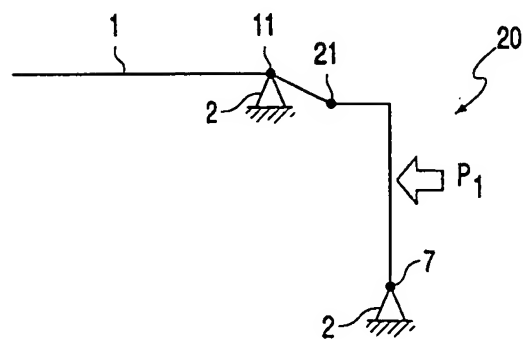


FIG. 5C

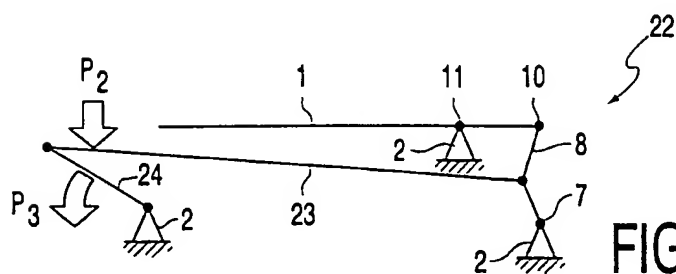


FIG. 5D

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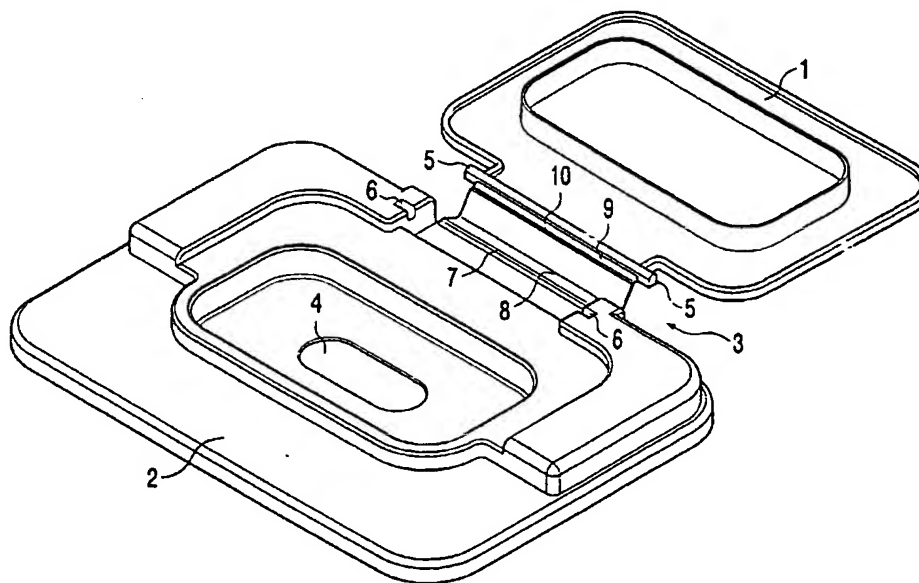
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(54) Title: HINGE ASSEMBLY AND PACKAGING



(57) Abstract: The invention relates to a hinge assembly for connecting a lid (1) to a container, comprising a lid hinge part (9) which engages pivotally on the container round a lid pivot axis (11), and a container hinge part (8) which engages pivotally on the container round a container pivot axis (7), wherein the lid hinge part (9) and the container hinge part (8) are connected for pivoting relative to each other round a coupling pivot axis (10). The invention also provides a packaging consisting of a container closable with a lid, wherein the lid is connected pivotally to the container via a hinge assembly as described above.

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 49 081178 A (XXXX) 5 August 1974 (1974-08-05) figures 1-13	1-7, 10, 11, 13-16
X	JP 49 083576 A (XXXX) 12 August 1974 (1974-08-12) figures 1-9	1-8, 11, 12
X	US 4 911 337 A (ROSENTHAL KARL-HEINZ) 27 March 1990 (1990-03-27) column 5, line 48 -column 6, line 26; figures 2,4,6,7	1,2,4-8, 10,13
A	US 4 805 790 A (LEONETTI FRANK A ET AL) 21 February 1989 (1989-02-21) abstract	1,13
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <div style="text-align: center; font-weight: bold;">Wartenhorst, F</div>

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 49081178 A	05-08-1974	JP 1030487 C JP 55019831 B	22-01-1981 29-05-1980
JP 49083576 A	12-08-1974	NONE	
US 4911337 A	27-03-1990	DE 3738682 A AT 77328 T DE 3872177 A EP 0316504 A ES 2033345 T JP 1139351 A ZA 8800465 A	24-05-1989 15-07-1992 23-07-1992 24-05-1989 16-03-1993 31-05-1989 22-07-1988
US 4805790 A	21-02-1989	NONE	

